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USEFUL RECEIPTS.

Mastic Cement.

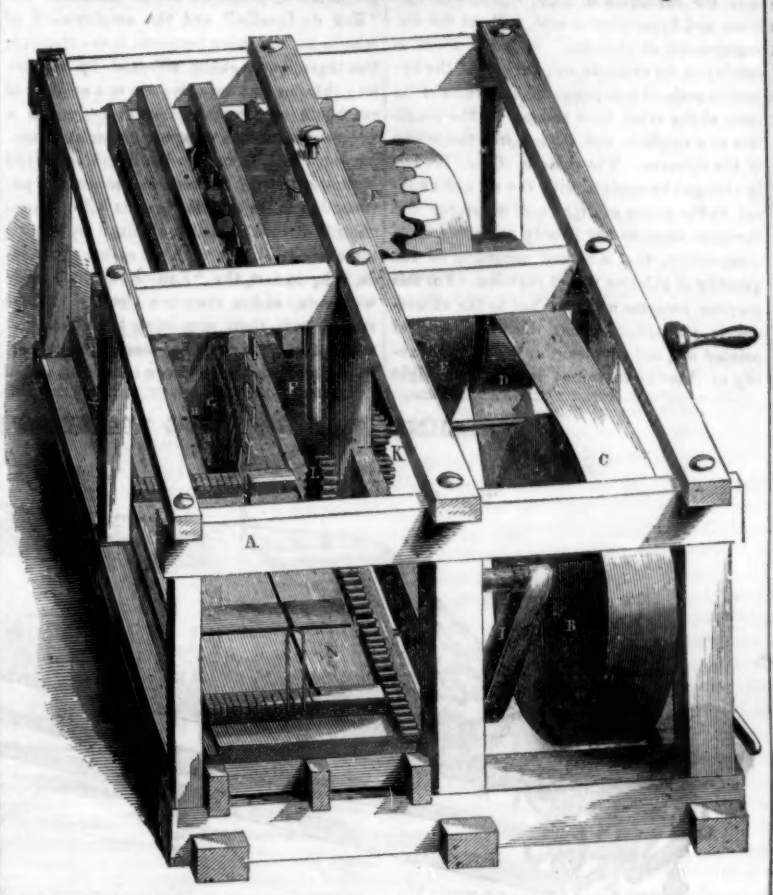
We have had many enquiries lately respecting the mastic cement for covering the fronts of houses and giving them the appearance of brown freestone. We have endeavored to find out its composition, and have at last, we believe, obtained reliable information respecting it. Red lead, oil, sand, and limestone dust, in some form, cover every compound of it. 50 parts by measure, of clean dry sand; 50 of limestone (not burned) reduced to grains like sand, or marble dust, and 10 parts of red lead, mixed with as much boiled linseed oil as will make it slightly moist, compose a mastic cement. The building of brick to receive it should be covered with three coats of boiled oil laid on with a brush, and all suffered to dry, before the mastic is put on. It is laid on with a trowel like plaster, but it is not so moist. It becomes as hard as stone in the course of a few months. Care must be exercized not to use too much oil—although no evil will be the result—excepting that the cement will require longer exposure to harden. The oil prevents rain and moisture penetrating, and this is the reason why this mastic is not affected with the weather. Various compositions will answer about as well as the receipt above. We will present a few.

100 parts (by measure) of clear dry sand; 100 parts of powdered limestone, and 5 of red lead, make a hard mastic; this may be varied with the addition of 10 parts of red lead. 100 parts of sand, 50 parts of whiting, and 10 of red lead make a moderately hard cement. 100 parts of sand, 25 parts of the plaster of Paris (or the same of marble dust) 10 parts of red lead, and 5 parts of yellow ochre, make a very beautiful and hard cement. As stated before, all of these compositions must be moistened with boiled linseed oil. The quantity of oil is so very small in proportion to the other materials, that the whole mass is very porous. The oil unites the particles together, it is the affinitive agent. The sand, &c., must be perfectly dry before they are mixed together; that is, they must be subjected to heat in an oven to drive off all the water contained in them. The sand should not be too coarse and should be passed through a fine sieve. Various coloring substances may be employed to mix with the above composition, such as any of the pigments used in oil painting. We would never use less than 10 parts of red lead in the cement.

The above compositions might be moulded into statues and works of art, by oiling the patterns inside, before putting in the composition and allowing the mastic to harden in the moulds before it is removed. Two ounces of rosin pounded very fine should be added for every pint of oil used. The whole must be mixed with great care to make the cement properly.

Steam engines for agricultural purposes have increased ten-fold in the last three years in England.

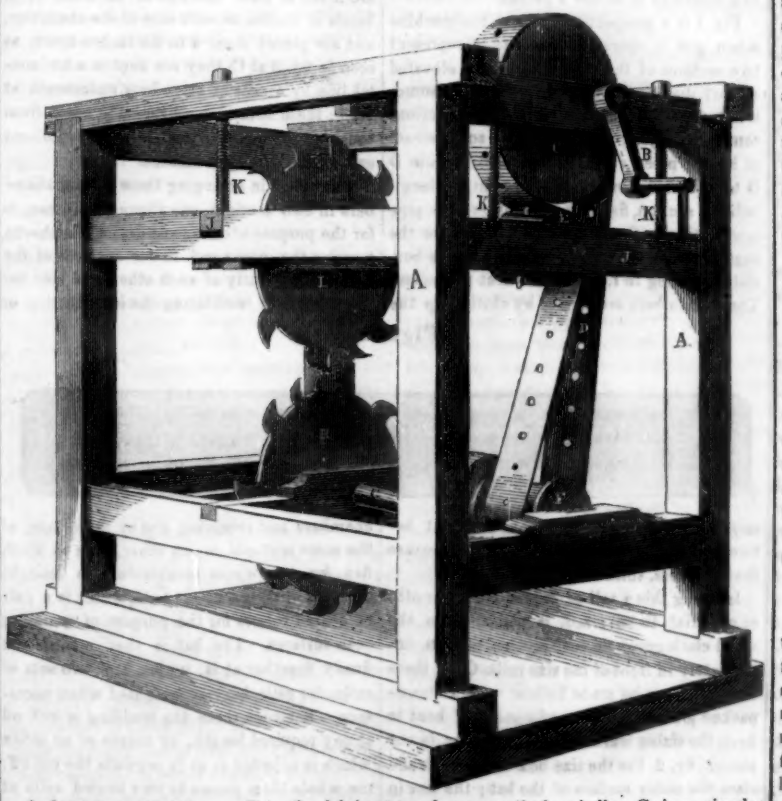
CIRCULAR SAW WITHOUT AN ARBOR, AND IMPROVEMENT IN TEETH OF CIRCULAR SAWS.---Fig. 1.



The annexed engraving, fig. 1, is an isometrical perspective view of a new mode of running a circular saw without an arbor, invented by T. J. Flanders, of Concord, N. H., who has taken measures to secure a patent. The principal feature in this plan, is that of the saw being run vertical, and its teeth made to form part of the gearing.

Figure 2 is a perspective view of an improvement in running circular saws, by the same inventor, Mr. Flanders, who has taken measures to secure a patent for it also.

Figure 2.



A, fig. 1, is a stout frame; B is the driving pulley, and C is the band passing over pulley, D, for driving the shaft of wheel, E. This wheel gears into the horizontal ones, F, which are secured on a vertical spindle; G is a circular saw without an arbor; it will be seen that the teeth of wheels, F F, gear into the teeth of the saw, and serve to support as well as rotate the saw; H H H H are small friction rollers situated in the frame, and made to press against the saw near its upper and under edges, so as to sustain it in its vertical position, and yet produce but a small amount of friction. These rollers are adjustable and can be screwed up to the desired pressure. The rest of the parts are in common use, such as the log carriage, N, moved by rack and pinions, L K, and made to reverse by the auxiliary belt, I, in the usual way. This circular saw without an arbor saws out boards from a log in the same line of cut as a reciprocating saw. The object of running a circular saw without an arbor is to enable persons to use smaller saws, large ones being very expensive.—The log passes through (as in the common mills,) within the space of the upper and lower friction rollers, H H.

A A, fig 2, is a stout frame; B is merely a handle on the driving shaft of pulley, C, over which the driving band, D, passes, running over the one side of the pulley on the upper saw (I) spindle or arbor, and then around the pulley, F, on the arbor, G, of the nether saw, H. The two saws, I and H, are constructed and arranged to saw logs, the upper one sawing through one half and the lower one through the other half. There is a peculiarity in the teeth of the saw. They are made one-half thinner than the plate, and thus make a fine cut, requiring less power to drive, and at the same time saving some timber; the teeth are set so as to make the board clear the plate, and a gouge tooth may be set on the saw, as a clearer. These teeth may be made of fine steel and inserted in the saw plate, which may be of wrought iron. As the teeth of the saws wear down by sharpening, an excellent arrangement is presented for keeping them always in the same relative position to one another, by lowering the arbor of the upper saw, and yet having its belt always taut. The bearings, J J, which support the spindle of saw, I, are suspended and supported by screw rods, K K K. These screws therefore lower the bearings of saw, I, just in proportion as the teeth wear down, and thus they are made to cut always in the same line. The belt, D, is always kept tight, owing to the mode of its arrangement, although the pulley, E, may be placed at any height in the frame; this is evident because it must pass over the same amount of pulley surface and through the same space. The pins in pulley, E, take into the holes in the belt, D, and by this means the spindle of saw, I, is revolved. These descriptions, we suppose, will render the machines and their operations, plain to all, as they are exceedingly simple.

For particulars address Flanders & Mansfield, Concord, N. H.

Gold Pens.

This elegant branch of manufacture is yearly progressing in importance as a source of industry, and nowhere is it more fully exemplified than in our own country. We are led to make the above remark from some specimen gold pens that have been presented to our notice by C. Piquette who received th first premium at the Michigan and Ohio State Fairs, and which, for variety and good workmanship are a fair sample of American skill.

Alligator Skins.

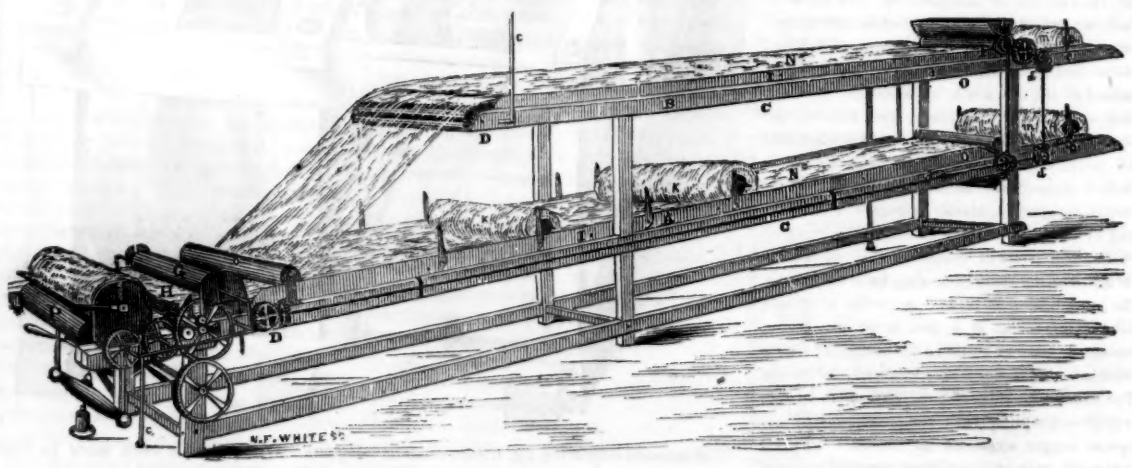
The "Houston Telegraph," (Texas,) says, that J. W. Benedict, of Galveston, has manufactured some of the most beautiful boots and shoes that we have ever seen, with leather made of alligator skins. The skins are tanned and prepared, so that they resemble the finest calf-skin in pliability, and are beautifully mottled, like tortoise shell. He intends to send a pair of boots to the World's Fair in New York. He certainly merits a premium for changing the skins of these huge, ugly, monsters to forms of beauty and usefulness.

MISCELLANEOUS.

Biography of Berthollet.

Berthollet the discoverer of bleaching by means of chlorine, and the chlorides, was a native of Savoy, and born in 1749, but emigrated and settled in Paris, where he was shortly afterwards made physician to the Duke of Orleans. Here he became the friend and competitor of the Lavoisiers, Fourcroys, Guiton de Morveaux, and Chaptals, and contributed, together with these latter, by his labors and discoveries, to bring about the brilliant change that was effected in chemistry and the arts. In 1794 he was named Professor of Chemistry at the Normal and Polytechnic Schools, and soon after the founding of the French Institute he was selected as one of the number of talented individuals that first composed that learned body. He afterwards formed part of the Scientific Commission that accompanied Napoleon Bonaparte in the expedition to Egypt, and on the accession of the latter to the imperial power was made a Count and elevated to the dignity of Senator. These distinctions, which were conferred on him by the French Emperor were not given solely through favor, but as a recompense for his important services in the cause of industry, and for a multitude of brilliant scientific discoveries, among which the law, so simple and precise, by which he determined the action of the salts on one another, would alone be sufficient to immortalize him. The process of bleaching vegetable matters by means of the chlorine and chlorides, for which we are also indebted to him, renders incalculable benefit to manufacturers from the rapidity which it allows of, in bleaching flax, hemp, and cotton yarns and fabrics. Formerly it was necessary, in order to bleach manufactured articles, to employ a method still adopted in some parts of France, which are still behind in industrial progress, and which consists in submitting the articles to the action of the lyes of potash or soda, and in exposing them afterwards for a suitable length of time to the moisture of the atmosphere by exposure in a field. By this exposure to the moisture of the atmosphere most substances that color vegetable matters are deprived of their hydrogen, and having been by this means brought back to the state of acids, they are rendered soluble in alkaline lyes. The greasy matters, which are also in fabrics, are brought back by the absorption of the atmospheric air to the condition of fat acids, which are changed into soap and easily dissolve. But besides the very long time that this mode of bleaching required the ligneous matter that composes the thread, underwent a noticeable alteration on account of the prolonged action of the humidity, and there was often developed on the surface of linen cloths cryptogamic vegetation, the traces of which it was afterwards impossible to get rid of. Berthollet substituted for this system that which consists in dipping the yarn or fabric required to be bleached in a solution of liquid chlorine after having, however, been placed as mentioned above in alkaline lyes. The chlorine, when present with vegetable matters, decomposes the water in which it is dissolved, so as to form chlorohydric acid, and the oxygen proceeding from this decompesition serves to oxydize the coloring and oily matters, and thus render them soluble. This process, which, as may be seen, causes, like the old method, the bleaching of linen by the oxydation of the coloring matters, offers the advantages of facility of execution in all seasons and with the greatest rapidity. The use of liquid chlorine presented, however, some inconveniences, by its easy evaporation it diminished the strength of the solution, and exercised a very hurtful influence over the workmen, that employed it. It is true that when the solution was weak most of these inconveniences did not show themselves, but then the little decolorizing power of these solutions was a great obstacle to the rapidity of the work. This is the reason that the hypochlorite of lime, commonly known as the chloride of lime, is now preferably employed. This salt, which is obtained by the action of chlorine in a gaseous form on lime, is in fact only a compound of the hypochlorite of lime and chloride of calcium, a compound that often contains hydrate of lime, which, having no chlorine, is entirely useless as a salt. The manner in which the hypochlorite of lime is employed is very simple, it is dissolved in water, and by means of an acid the chlorine is released, which, forming, as has been already said, hydrochloric acid, at the expense of the hydrogen in the water, sets at liberty the oxygen that deprives of color the vegetable matter. Carbonic acid should never be employed for this operation, but, on the contrary, a more energetic acid; for the carbonic acid not decomposing the hypochlorous acid, there would be obtained, for a result, only the carbonate of lime, chloride of calcium, and hypochlorous acid, without the disengagement of chlorine. Whilst if there is employed, for example, sulphuric acid, the hypochlorous acid is decomposed, the whole of the lime, at the same time passing to the condition of a sulphate, and setting free the whole of the chlorine. The chloride of lime is easily changed by contact with the air and exposed to the action of light and moisture, it is therefore usual to buy it only according to its composition, that is to say, according to the quantity of chlorine that it contains. For this purpose recourse must be had to the chlorometric experiments that Gay Lussac first pointed out, and by means of which the quantity of chlorine contained in a given weight of hypochlorite of lime can be determined with exactness and precision. These experiments, which the shortness of the article does not allow of our describing in this place, are based on the property that chlorine possesses, of changing, by its passage to the condition of chlorohydric acid, arsenious acid, into arsenic acid. Experience has shown that cotton fabrics lose, on a mean, in the process of bleaching, 28 per cent. of their weight, the loss that articles made of flax and hemp are subjected to, varies from 28 to 30 per cent. Berthollet first made known the composition of the hypochlorite of potassium better known as the "Eau de Javelle," and the employment of which, for bleaching purposes, is so extensive; this ingredient is easily obtained by immersing chlorine in a gaseous state in a solution of carbonate of potassium, for this purpose a very weak solution of potassium must be employed. In like manner the liquid employed by musical-string makers, to prevent the putrefaction of the animal fibres, is only a hypochlorite of soda, which is obtained by mixing the chloride of lime with the carbonate of soda, it is, in fact, the "Eau de Javelle" made with soda, and is therefore cheaper. These various salts, from permitting the disengagement of gaseous chlorine, possess the property of purifying the air when spoiled by putrid substances. It was beneficially employed, in 1815, by M. Thenard, to arrest the progress of an epidemic that was committing great ravages in a portion of Holland. Fourcroy had previously recommended the employment of chlorine for purifying dissecting rooms and stables in cases of epizooty. The work entitled "Statistical Chemistry," in which Berthollet recounted most of his discoveries, is and will remain one of the most important works that have been published in chemistry. He retired from active life in 1807, to Arcueil, where he founded a society composed of physicians and chemists, who had been his pupils, and who published, under the title of "Memoirs of Physics and Chemistry of the Society of Arcueil," a scientific collection, in which are described the greater part of the discoveries of that period. Berthollet, made Peer of France in 1814, died Nov. 6, 1822, at 63 years of age. He was a man of talent and genius, and the probity and disinterestedness which he always exhibited, acquired for him universal admiration and esteem. This process for bleaching by chlorine might have enriched him, but he preferred making it public—all the advantage that he derived consisting in a few articles bleached by his process, which an English manufacturer sent to him as a present.—["L'Invention."

WADDING AND BATTING MACHINERY.---Fig.1.

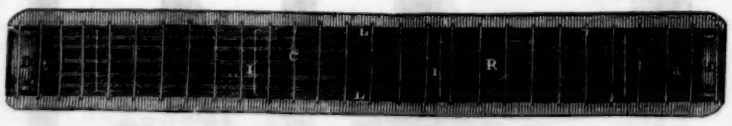


The annexed engravings are views of an improved machine for sizing, drying, and doubling textile materials for wadding and batting purposes. It is the invention of Hiram J. Lawton, of Troy, N. Y., who has taken measures to secure a patent.

Fig. 1 is a perspective view of the machine when put in operation. A and B represent two sections of the strong frame, one elevated a short distance above the other, and somewhat shorter. Each of these two sections contains a drying chamber, with small steam or hot air pipes running horizontally from D D to O O, but more clearly seen in the longitudinal section, fig 2, in which R is the pipe intersecting with a cross-pipe at *a*, where the heat is admitted, through the side of the box, and extending to *t*, where the heat passes out. These chambers are formed by closing up the under side of the frame, also the ends, in order to prevent the escape of the heat, except upward through the sized material, which is carried over three chambers by endless aprons, operated and driven at D D. These aprons are made of slats fastened at each end upon bands or chains, on each side of the chambers, and are placed from 4 to six inches apart, as seen in fig. 2 at C; they are kept in a horizontal line by means of cross bars underneath at I I I; these bars also prevent the apron from touching the heated pipes, in their revolutions around the drying chambers.

The object in arranging these drying chambers in two sections, one above the other, is for the purpose of sizing and drying the sheets, forming the upper and lower surfaces of the bat, independently of each other, and also for the purpose of facilitating the introduction of any number of bats of fibrous material between the sized sheets in order to increase the thickness, suitable for all purposes.

Figure 2.



In doing this a roll of carded cotton or other material to be sized, is placed upon the small cloth apron on each section, at *m m*, immediately in front of the size rolls, O O; these size rolls may be made hollow with a steam-packed journal, for the admission of heat to keep the sizing warm. The one in the lower section, fig. 2, has the size box underneath and sizes the under surface of the bat; the one in the upper section has the size box arranged with an aperture in its bottom and fixed with set screws, in order to raise it from the roll, so as to regulate the quantity of sizing upon the upper surface. After passing over the drying chambers and receiving one or more bats, of the same material, or any other, such as wool, flax, &c., the whole combination is brought together at O, and passes to G, which is a pair of heated rollers for the purpose of warming both surfaces. The bat is then compressed firmly together at H, which are two sets of callender rolls, heavily weighted when necessary. Between these the wadding is cut off at any required length, by means of an index which is adjusted so as to regulate the cut off; the whole then passes to two heated rolls at P; these serve to dry off any dampness which might remain, and also roll up the finished wadding; it is then taken off and put up for use.

We have been informed that the above machinery operates in a very satisfactory manner; its principle of operation is certainly good, and should meet with attention.

More information may be obtained by letter addressed to Mr. Lawton, at Troy.

The Greek of Homer a Living Language.

An effort, says the "Westminster Review," has been made by Mr. Blackie, Professor of Greek in the University of Edinburgh, to reform the pronunciation of Greek as they do in Greece, insisting that it is not a dead, but a living language—as any one may see by looking at a Greek newspaper. Professor Blackie gives an extract from a newspaper printed last year at Athens, giving an account of Kossuth's visit to America, from which it is evident that the language of Homer lives in a state of purity, to which, considering the extraordinary duration of its literary existence—two thousand five hundred years at least—there is no parallel, perhaps, on the face of the globe. After noticing a few trifling modifications, which distinguish modern from ancient Greek, he states, as a fact, that in three columns of a Greek newspaper of the year 1852, there does not certainly occur three words that are not pure native Greek; so very slightly has it been corrupted from foreign sources.

Since the discovery of the silver mines of Potosi, there have been extracted from them not less than sixteen hundred millions of dollars! The vein is said to be as rich now as ever it was; but it is not worked for the want of mechanical force such as steam, and the facilities which steam alone can furnish.

Several cars loaded with cotton took fire on the Charleston Railroad, which were totally destroyed, the heat being so intense as to melt the wheels and rails.

There are ninety six thousand tons of granite, finished and unfinished, exported from the town of Rockport, Mass

Machinery and Tools as they are.—Rolling Presses.

The pressure that can be obtained by passing an object between rotary rollers is probably more intense than that acquired by any other means, and the above-mentioned description of machinery has been used for a considerable period in the manufacture of sheets of malleable iron, steel, and copper, when in the red-hot state, but most others of the metals and alloys are rolled whilst cold. This economical application of power often nearly supersedes the use of the hammer, as it performs its function in a more uniform and gradual manner, and at the same time increases to the utmost the hardness, tenacity, elasticity, and ductility of such of the metals and alloys as are submitted to this and similar courses of preparation for the arts generally.

It is in the manufacture of malleable iron, preparatory to its being consigned to the hands of the smith, that the serviceable character of the rolling press is most conspicuously displayed. By the usual system the use of the rolls is subsequent to the prior process of "shingling" or working the balls of metal under a massive forge hammer, although it has been proposed to dispense entirely with the hammer substituting for it roughened rolls. A still later expedient for this purpose is the employment of three inverted cones, having such a relative position to each other that a space like a hopper is left between them. A mass of iron being thrown into this receptacle is gradually drawn down by the revolving cones, and well compressed during its transition, the fibres being also twisted in the same manner as yarns in a strand of rope. The rollers intended for iron works are turned in a variety of forms according to the section of the metal that is to be produced. One pair will have a series of angular groves for square bars, while others correspond to the shape of angle and railway iron. Others again are composed of a series of steel discs, placed upon a spindle to slit thin plates into a number of small rods for the manufacture of nails. The cylindrical rollers used in paper-making machinery for pressing the single sheet of paper as it is produced by the machine require that the two surfaces should fit each other with great accuracy, in order that the rollers may act uniformly upon the paper, and the surfaces at the same time are required to be very smooth, that they may may impart a finished surface to the paper. These rollers are sometimes six feet long and of eighteen inches diameter, and they are finished by an exceedingly tedious operation, being made to abrade each other without any sand or emery being employed. The engraver has long been aware of the exceeding power exerted by this form of press, and finding himself compelled to produce the most intimate contact between the paper and the metal plate on which his skill has been expended, he finds the common printing press inadequate to transfer the fine lines of the original. But by placing the plate and paper upon a bed, and passing them through the rolling press the faintest lines are reproduced.

One of the most elegant applications of mechanical science to the fine arts is due to American genius. We allude to Mr. Perkin's admirable process of transfer engraving, which may be thus explained · A soft steel plate is first engraved with the required subject in the most finished style of art, either by hand or mechanically, or the two combined, and the plate is then hardened. A decarbonized steel cylinder is next rolled over the hardened plate by powerful machinery until the engraved impression appears in relief, the hollow lines of the original becoming ridges upon the cylinder. The roller is re-converted to the condition of ordinary steel and hardened, after which it serves for returning the impression to any number of decarbonized plates, each of which becomes absolutely a counterpart of the original, and each plate, when hardened, will yield the enormous number of 150,000 impressions without any perceptible difference between the first and last. In the event of any accident occurring to the transfer roller, the original plate still exists, from which another or any required number of rollers can be made; and from the rollers any number of new plates, each capable of producing as many impressions as above cited. This invention is most valuable, as it allows an unlimited number of proofs to be obtained from a plate executed at a great expense, and bankers and manufacturers have not been slow in availing themselves of the protection that it affords against counterfeiting. It will perhaps, in this place, be scarcely deemed a digression to dwell for a moment upon the best mode of annealing and hardening the steel rollers and plates. Several of these are placed in a cast-iron box and surrounded on all sides by fine charcoal mixed with an equal quantity of chalk, which is driven in firmly, the box is then placed in a furnace and exposed equally to the heat. The cooling extends over a space of 48 hours at least, the surface of the rollers and plates is then removed, and the device is raised in the transfer press. The plates are generally used in the soft state, but, as well as the rollers, are often hardened by being placed in a wrought-iron box with a loose cover and false bottom; the steel is surrounded by carbon from leather driven in hard, the cover and under side being luted with moist clay. The box is heated quickly, and then placed over a large tub of water, after which the bottom slide is quickly removed, and the steel rollers immersed in this manner. With precaution the most delicate lines escape injury. The apparatus employed for curving plates is also well worthy of attention, it has two cylindrical rollers which travel in opposite directions, with a third roller just opposite these two, and which is capable of vertical adjustment When, therefore, the metal is carried along by the former two rollers, it strikes against the core of the bending roller, and is curled up to enable it to pass, so that it assumes a circular sweep, whose radius is dependent on the position of the roller, and when this is placed out of level, the work is then thrown into a conical form. However this press may be constructed, the same principle prevails in all, namely, the application of three forces.

The manufacturer of tubes avails himself, likewise, of the rolling press, and here it must be observed that the great feature of modern times, in the manufacture of tubes, is the being able to dispense with all internal support, and to complete the tube by external pressure alone, which is preferably given by grooved rollers.

Daguerreotyping.

Niepce, the original discoverer of the art in conjunction with Daguerre, used exclusively the bitumen of Judea; this substance is changed by light, only with much slowness, yet irrespectively of the pictures taken in the camera, he succeeded in copying engravings by the sole action of the light, and in making others, from which a limited number of impressions could be taken. He operated at first on tin plates, for which he afterwards substituted thin sheets plated with silver; it was while endeavoring to strengthen the shades of his impressions on the plate that he used iodine. By this means he discovered the photogenic properties of the coating of iodide of silver, which are manifested by a deep change of color, an unexpected result for the iodide of silver precipitated, is perhaps the insoluble compound of silver that darkens best in the light.

To Take out Stains from the Hands—A correspondent gives the following directions for taking out stains on the hands of Daguerreotypists:—Blue spots are produced by the union on the skin of a salt of iron with the cyanide of potassium. In this manner, unintentionally, Prussian blue is formed; now Prussian blue is soluble in caustic alkalies, it can therefore be made to disappear by rubbing the dyed part with a weak solution of potash or caustic soda; ammonia likewise gets rid of it. Yellow spots are attributable to the formation of a sub-salt, or an oxide of iron. When recent they disappear more easily than when they have been allowed to remain for some time; in the first case oxalic acid is useful, or the salt of sorrel; in the second hydrochloric acid, diluted with two or three times its volume of water.

Black marks may be of two kinds: if they are owing to the union of a salt of iron with gallic acid, which forms common ink; they can be made to disappear with hydrochloric acid prepared as above. If they are owing to the action of a salt of silver on the gallic acid, by moistening them with hydrochloric acid, they can be classified in the list of ordinary stains of salts of silver. These latter always dye the skin black; in time this color changes to a violet, afterwards to a dark brown, to a light brown—and at last disappears. To get rid of these stains the employment of an alcoholic solution of iodine has been advised. This method often efficacious, has the fault of dyeing the skin a yellow fawn color, the more disagreeable because it continues for several days. The infallible remedy is the cyanide of potassium. By spreading it in a powder over the part to be taken out, and then gently moistening it with water and rubbing it over the same, it will always clear off the stain Cyanide of potassium is a strong poison, it is therefore proper to prevent any harm that might result from its introduction under the nails or in a scratch, to wash the hands afterwards with a little chlorine, or, preferably, Javelle water. The following is a resume of the directions to be employed:—

1st. Using hydrochloric acid, which destroys the yellow color, owing to the salts of iron, and which restores all the salts of silver to the state of chlorides.

2nd. Soda or any other caustic alkali which takes off the blue color attributable to Prussian blue, and neutralizes the little acid remaining on the skin after the former operation.

3rd. Cyanide of potassium, which takes away all the stains due to the salts of silver.

4th. Lastly, for sanitary precaution, chlorided or Javelle water.—[Lumiere.

Atmospheric Hammer.

A mechanic in Rochester has invented an atmospheric hammer, intended to displace the trip and tilt hammers. The principle applied to move the implement is not unlike that of the caloric engine. The "Rochester Advertiser" explains the operation as follows:—The hammer in question derives its force from an exhausted cylinder—the vacuum being made by the turning of a crank by which the piston is raised and all the air forced out, when the connection is broken and the piston falls with the greatest velocity and force.—The entire weight of the hammer, cylinder, piston, and all the model in question, is but little over four pounds; yet it is competent to give a blow equal to seventy pounds. By means of a valve and key at the bottom of the cylinder, just so much air may be let in as may be desired, so that a light blow or a heavy one is produced at will. An eight inch cylinder will produce a force equal to the falling of 500 pounds upon the anvil, and the repetition of the blows will be in proportion to the velocity with which the crank is turned.—Exchange.

[The man who wrote the above certainly knows little about atmospheric pressure or the caloric engine. It is said that the action is like the action of the caloric engine, and that it is operated by a *vacuum*. Now there is no vacuum chamber or cylinder about the caloric engine, and there is never a vacuum in it. The piston mentioned above never can fall with the *greatest velocity* and force. Its pressure never can be more than 15 lbs. on the square inch, and its velocity is measured by the well known law of falling bodies. The vacuum is formed, it states, by turning a crank; very well, some person or machine must turn this crank. To do so a steam engine is the best power, therefore, the steam hammer is better than the atmospheric one. A hammer, however, can be operated by a water wheel compressing or exhausting air by well known means, such, perhaps, is the mode by which the above hammer is intended to be operated.

Spots on the Sun and Magnetic Variations.

We find the following statement in the "National Intelligencer," from its London correspondent:—

Mr. Faraday, in a late lecture before the Royal Institution upon the Magnetic Forces, made the following important announcement:

"A German astronomer has for many years been watching the spots on the sun, and daily recording the result. From year to year the groups of spots vary. They are sometimes very numerous—sometimes they are few.—After awhile it became evident that the variation in number followed a descending scale through five years, and then on an ascending scale through five subsequent years—so that the periodicity of the variations became a visible fact.

While our German friend was busy with his group of sun-spots, an Englishman was busy with the variations of the magnetic needle. He, too, was a patient recorder of patient observation. On comparing his tabular results with those of the German astronomer, he found that the variations of the magnetic needle corresponded with the variations of the sun-spots—that the years when the groups were at their maximum, the variations of the needle were at their maximum, and so on through their series. This relation may be co-incident merely, or derivative; if the latter, then do we connect estral and terrestrial magnetism, and new researches of science are open to us."

Agassiz and Humboldt.

Dr. Gibbes, of Charleston, at a dinner of the Medical Society, recently given, concluded a speech with this anecdote:—

When Agassiz first came to this country, he was under the direction of Baron Humboldt, to whom he was largely indebted for aid in his pursuits, and though desirous of remaining here, he felt bound to return to Europe.—Having received the offer of the Lawrence Professorship at Cambridge, he declined it on this account; but, in writing to his patron, he mentioned this fact, and at the same time expressed a desire to remain longer in the United States. The reply of the noble man was:—

"Sir, you belong to no country—you belong to Science; that is your country. You are released from any obligation to us; if you find the field of science furnishes you a better opportunity for your labors in the United States, you must remain there."

The Moose.

Prof. Baird, of the Smithsonian Institute, recommends the domestication of this animal, as they combine the qualities of the horse and ox. He says, "harnessed to a sled, a pair of them in Canada are reported to have travelled two hundred miles in one day," which may be regarded as a long story. A Swedish writer recommends their employment in time of war, for the cavalry and light artillery, from which he predicts great advantages would be derived in battle. At one time their domestication was forbidden in Sweden on account of their having been employed, from their extraordinary speed, to effect the escape of criminals. Recently, a law was passed to prevent their destruction for ten years.

Caloric Steamship.

The "Scientific American" comments with much good sense and consistency upon the unthinking enthusiasm with which certain papers give an account of the experiments made at the present time, in one of the New York docks, with a hot-air engine, which has been placed in a splendid vessel. Not that Messrs. Munn & Co. have any ill-will towards Mr. Ericsson's invention; quite the reverse, but they are right in displaying caution, and in advising a similar course to their less competent co-editors in such matters. If, as it is to be hoped the Caloric Steamship succeeds in the experiments that are being made, the new motor will make its own character for itself without the assistance of others. Of all things, keep us from imprudent friends."

[The above extract is translated from the "Invention," an excellent and ably conducted monthly periodical, published at Paris by M. Gardissal, and devoted to industrial, mechanical, and scientific objects in general. The same journal likewise notices our remarks on the injustice of the law, by which the foreign inventor is mulcted in the sum of $100, when his claim has been refused,—as well as on the necessity of lowering the fees to English subjects, now that England has given the initiative.

NEW INVENTIONS.

Safety Steam Boiler.

Measures to secure a patent for improvements in the above have been taken by Stephen Waterman, of Williamsburgh, N. Y., the original invention having been patented on the 28th of Dec., 1852. It is an improvement on the plan for preventing the serious casualties consequent to boiler explosions, which was noticed on page 108 of the present volume. It will be recollected that a "safety chamber" was placed upon the boiler, and that when the steam attained an undue pressure it tore a plate which separated the chamber from the boiler, and as the steam gained additional space, its pressure on the square inch was reduced. This plan, although completely effective, involved the necessity of a large safety chamber, it is to reduce the dimensions of this appliance, that the present patent is chiefly designed. A reservoir of cold water is placed in juxtaposition to the boiler and its appurtenances, so that the top communicates with the boiler and the bottom with the "safety chamber," both communications being opened and closed by cocks. By this contrivance, when the plate bursts, its disruption acts upon an arrangement which opens both communications, and the steam pressure on both sides of the water being equalized, this latter fluid, by its gravity, will descend into the chamber and condense the steam, or if considered preferable, it might pass directly into the boiler.

Improved Cotton Press.

A press of an improved description, for cotton, hay, and other articles, has been invented by Levi Dederick, of Albany, New York, who has taken measures to secure a patent. In this machine two followers are employed, one at each end of the box, which are operated by double levers, likewise fixed at either end, and worked by means of cords and pulleys. The article to be pressed is placed in the box, and the ends being drawn outwards, the outer ends of the levers are of course depressed, and the followers forced inwards, the article being pressed at the centre of the box. The levers and followers are restored to their original position by turning a winch at each end of the press furnished with cords and rollers.

Another Press.

This is a press for similar purposes, by the same inventor, who has taken measures to secure a patent for it. The improvements, however, are of a different nature from the last exhibited. and are not intended to alter existing mechanical arrangements, but merely make a change in the shape of the box, and the method of securing certain doors with which the inventor proposes to furnish it. The shape of the box is rectangular, rather greater in height than width, and it is provided with end doors and a side door. If two followers are used there is a door at each end, but if only one, then one end alone is provided with a door. The arrangement of the side door is likewise suited to the circumstance of one or two followers being used. In the latter case it is placed at the centre, and in the former, at the end, this is done to suit the convenience of taking out the bale, which will be pressed at the centre of the box or down at the bottom, according as one or two followers are employed. The other improvement in this invention consists in the fastening for the doors, which, particularly in the instance of the side door, is made with very great stability, a precaution that it will be evidently seen is very necessary when great pressure is employed. The end doors are in like manner secured in an efficient manner by means of a bar which can be easily turned, when the doors are required to be raised or opened.

Improved Trip Hammer.

Measures to secure a patent for improvements in the above have been taken by William Van Anden, of Poughkeepsie, N. Y. In this invention there are two distinct improvements. The first enables the workman to regulate the force with which the hammer descends upon the anvil, and the second is a superior manner of placing the friction rollers which receive the action of the cams. The hammer shaft is attached to a collar which works loosely around a shaft provided with a spring, whose duty is to force down the hammer, which it does with more or less energy according to its adjustment. When the cam shaft is made to rotate, the hammer shaft is elevated by the action of the cams against the friction rollers, which are placed in a frame capable of vibration, so as to relieve the cams after their highest points have performed their functions. A third cam, acting through the medium of a lever and set-screw, causes a spring to bear against the hammer shaft when the downward motion is to take place.

Soap Cutting Machine.

Measures to secure a patent for improvements in the above have been taken by James B. Duff of New York City. This machine is intended to cut soap into bars and cakes, and contains several improvements over the apparatus hitherto used. The vertical knives which are of wire, are not kept taut whilst cutting, but are capable of yielding, so that they form a loop, whilst passing through the soap, which will have a smooth and straight appearance when cut in this manner. The material is fed up to the cutters by a bed which is made to traverse by means of a rack and pinion, two horizontal wire cutters serving to smooth the top and bottom of the soap. The bars are cut into cakes by a similar plan, except that the wire cutters in this case being short do not require to yield. A self-adjusting spring lever regulates the delivery of the cakes when cut.

Improved Metal Tubes.

Measures to secure a patent for the above have been taken by Ernest Marx, of New York City. This invention consists in making tubes by rolling up sheets of iron or other ductile metal in successive convolutions until the required diameter and thickness are formed, and the securing it in such form by any suitable means. Tubing thus made may be used for machine-shafting or connecting rods, for masts of vessels, and for almost all purposes where tubes or bar-iron are employed. The advantage proposed is its capability of offering great resistance to tension, torsion, or flexure, being stronger in proportion to its weight than bars or tubes made in any other way, for the reason that any flaw or defect in the metal cannot extend far.

HEATING AND VENTILATING BUILDINGS.

Figure 1.

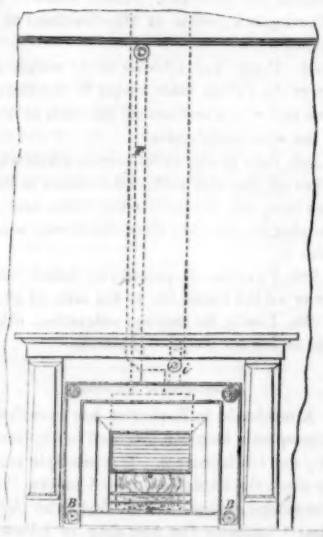


Figure 2.

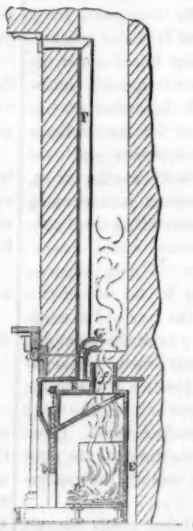


Figure 3.

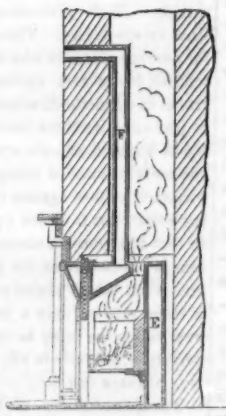
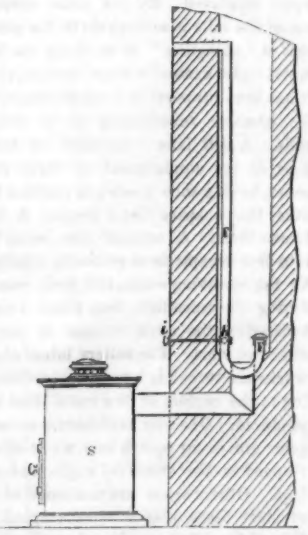


Figure 4.



The annexed engravings are views of improvements in warming and ventilating buildings, taken from "Newton's Repertory of Arts Inventions," &c., London. It is a subject which is frequently urged upon our notice by correspondents, and we endeavor to embrace every opportunity to present something that may be of general interest.

Figure 1 is a front view of an open fire-place with the arrangements for ventilating. Figure 2 is a vertical section thereof. Figure 3 is a vertical section of a plan of carrying out the improved mode of ventilation, and figure 4 is a view of the system applied to a chimney in a dwelling where a stove is used.

In figures 1 and 2 the fire-place consists of a box made of sheet-iron, lined with fire-brick; the lower end of the fire-brick is inclined outwards for the purpose of reducing the capacity of the fire-place without diminishing the radiating surface. The grate is placed in the usual recess under the chimney the lower end of which is closed—as in figure 2—leaving only an opening for the metal flue, *f*, of the fire-box. The space, E, round the grate, is closed in front by a plate, so as to form a close chamber into which air may be admitted from the lower part of the room, at the openings, B B, figure 1, such openings being furnished with slide valves, to be opened and closed at pleasure. From the upper part of the space, E, there rises a pipe, F, the upper end of which communicates with the upper part of the room near the ceiling, as shown in figures 1 and 2. It will therefore be understood that cold air may be admitted to the space, E, through the holes or openings at B, and after being warmed in the space, E, it will pass up the pipe, F, into the room. A continuous current is thereby produced, so that the air admitted to the space, E, is not burned, but merely warmed before it issues into the room. If by this arrangement the atmosphere of the room is rendered too warm, it will only be necessary to close the openings, B B, by means of the slides, and then there will be no current of air through the pipe, F. The same arrangement may also be employed for ventilating the room, for which purpose it will only be necessary to cause the vitiated air in the upper part of the room to pass down the pipe, F, into the space, E, when it will be conducted into the chimney by the short pipe, G. This pipe has its mouth bent to keep the soot from falling into it; but a better plan is to have it straight with a cap over it. This short pipe is furnished with a throttle-valve, *h*, which is worked by a button, *i*, and when the room requires ventilation, it will only be necessary to open the valve, *h*, and close the valves, B B; the heated air of the room will then pass down pipe, F, into the case, E, which is filled with hot air, and the vitiated air from the room will then pass up the chimney through the pipe, G. When the room requires warming, the throttle valve, *h*, must be closed and the slide valves, B B, opened when the cold air will be warmed by contact with the heated sides of the case, E, and it will then ascend by the pipe into the room.

In figure 3 the lower aperture of the chimney is not closed as in figures 1 and 2, and the construction of the fire-place is such that it may be applied to any chimney without the necessity of closing the bottom part. In figure 3 the fire-place is enclosed in an outer casing so as to form a space, E, between the outer and inner casings, into which space air is admitted either at the bottom or from the upper part of a room. The tube, F, which conducts the vitiated air from the room terminates at the bottom in this chamber.—When it is required to warm the air of the room by passing a portion of it through the space, E, air is admitted through a branch side pipe into said space. The branch pipe which admits the air into, E, below, has a valve in it to regulate the quantity of air to be admitted, and to open and close the communication. The room can be ventilated by closing the valve which admits the cold air below by the pipe into chamber, E, at the back of the fire, when the hot air from the upper part of the room, will pass down pipe, F, go into chamber, E, and pass away by an opening at the back up into the chimney.—This mode of heating and ventilating rooms is upon the syphon principle; one which is old and well known, but which may, as shown, be applied in many ways.

In figure 4 the stove, S, is of any of the known forms—it looks much better in its plain unpretending style than the florid ornamental stoves in common use. The pipe is inserted in the chimney which is closed at the bottom to exclude any air except that which passes through the stove. The syphon pipe is shown at F. It is furnished with a valve, *h*, and button, *i*, for opening or closing communication with the room. The heat of the chimney is sufficient to rarefy the air in pipe, F, and thereby cause a draught from the room, which will by this means be ventilated. The stove is a close one; the door opens in front of the circular grate, and it is made of wire gauze which acts as a blower.—The ventilation is shown as applied to the stove; the heating of the air by the grate plan being accomplished by the stove itself, which is placed in the room, and which, on this account, as is well known, heats a room with far less coal than a grate in the chimney. The fire-place with a grate, however, is the most cheerful plan, and is the one in general use in this city in sitting rooms, parlors, &c.

The greatest part of the heat generated in a grate goes up the chimney, and is lost so far as any benefit is derived from it by persons in the room. Dr. Arnot, by exposing ice in a chimney made the discovery, that more of it was melted in a given time there than in the room; this led him to invent the stove which still bears his name. Great attention should be paid to the best methods of economizing fuel, and proper ventilation. We have often directed attention to these questions by illustrating Ruttan's system, and in the notice which we presented two years ago, of Dr. Griscom's work on the subject. We have only to add at present that if all stove doors were made to open in front of the grate, and had a slit in the lower part to admit air by a wire gauze screen under the grate to supply the oxygen requisite for combustion, a great improvement would be effected. The coals could be fed in at the top, and the door used only for cleaning out the contents of the stove with a shovel. The door should be small and made with ribs fastened to it inside. The common ash pan cannot be dispensed with.

A proposition has been brought before Congress to purchase 100 fire annihilators for the use of the navy. The price will amount to $2,500 for the large size.

Beet root sugar is now made successfully in Ireland.

Scientific American

NEW-YORK, MARCH 12, 1853.

To Our Readers.

This number completes the first six months of Vol. 8, Scientific American, and we return our sincere thanks to our friends for their liberal and hearty patronage. Our circulation has greatly increased, and had we commenced the present volume with printing five thousand more copies than the number we have issued, we would have found subscribers for them all. We hope that those of our subscribers whose half-yearly term now expires, and who have not renewed their subscriptions, will do so at the earliest opportunity, in order that they may have all their numbers complete. Every article is finished in this number, and the next half of the volume will be commenced with new articles, so that new subscribers will have an excellent opportunity of beginning with a number, the first of 26 that will form a half volume complete in itself. As the Crystal Palace will be open this summer, our pages will be embellished with many beautiful engravings of interesting machinery displayed there, and our columns will be furnished with information which no mechanic, artisan, or man of science can well do without, and be posted up with the progress of the age. To secure future numbers, we urge upon our readers to send in their subscriptions early, as it has been a subject of regret to us that we had to say to so many, "all our back numbers are gone." As our circulation has increased we have improved the Scientific American, and this onward course and policy we shall always pursue. We shall print an extra quantity of our next number in order to meet new demands, and with honesty and truth for our mottoes; a desire to be severely correct in the information we obtain; and with energy, means, and enterprize, to obtain the most reliable and earliest information about inventions and scientific matters, we trust that before another year passes away we will be able to say, "the Scientific American has 30,000 subscribers." We ought to have this number now, considering the amount of our population; and with the influence and kind interest of our readers among their friends, we hope to obtain it. If every subscriber would get a new subscriber the result would be accomplished. We believe such a result (while we confess it would greatly benefit us,) would also benefit our people, as the information we present is really useful and elevating, not only instructive for a day but for all generations.

What of the Railroad Prizes?

It seems to us that all the public bodies about town are "tarred with the same stick." Our Common Council, owing, as some say, to our dirty streets—the worst kept and best paid for in Christendom—have got themselves deep into the mud, and the American Institute, not a whit behind, has fallen as deep into the mire. All our readers know what fine prizes were offered by F. M. Ray, through the American Institute for certain railroad improvements, and how so many very excellent inventions were presented at the last Fair of that foggy Body, to the no small loss of time, money, and skill to many inventors, and yet not a prize has been awarded, and not a report yet made on the subject by that dignified Pound of a corporation.

We think it is high time for the Examining Committee of the Institute to make a report. You gentlemen certainly have had enough of time to sleep, eat, drink, and talk over the subject since that notable day when the Fair closed. Do you call yourselves true Americans, and dilly daily in this manner about the business entrusted to you. Uncle John Bull, gouty old gentleman, would have run round the world in the same time. You have usurped the name of "American Institute," for your acts are not characteristic of the American character. Report yourselves *lost*, or something or other, only give us a report, and let us know whether or not it is time to write your epitaph.

We hope the Institute will soon put out its circular for holding its next Fair,—it will be a pleasure to read some of its new promises.

Railroad to the Pacific.

A railroad to connect the Atlantic with the Pacific Oceans by steam, so as to unite the Eastern with our extreme Western States, is certainly something much desired by all our citizens. Various plans have been proposed to effect this object. A few years ago Whitney's plan for a railroad to be constructed by himself from a grant of land made by the government, created a great deal of excitement throughout the Union. The projector of it, with much energy, travelled through the various States, and was the means of getting (we think) a majority of the Legislatures to pass resolutions favorable to his scheme. One or more committees appointed by Congress reported in favor of it. Yet, for all this, as a scheme to be adopted, it never really received the serious attention of any Session of Congress. A memorial was presented last year to the Senate by Robert Mills, C. E., of Washington, who proposed a plan and route entirely different from that of Mr. Whitney. The Committee on Public Lands, Senator Borland chairman, made a report on said memorial, and by it a Bill was presented for the construction of a railroad to the Pacific, which bill was the subject of warm discussion in the Senate. The proposed centre of this railroad in the States, was Memphis, Tennessee, but the appropriations for the construction of the road through existing States was met with objections of unconstitutionality. The Bill was amended, to provide only for its construction by government through Territories, and finally, it has come down to an appropriation for a survey, and no more. It certainly does appear to be reasonable that the route should first be thoroughly surveyed and reported upon before money is voted to construct the road. In all likelihood there will be much contention among some of the States west of the Mississippi for the advantage of being the "heart" to the great veins and arteries of railroads in these United States—Atlantic and Pacific. Be that as it may, there can be no doubt of the necessity and advantages of such a railroad being constructed, and the sooner it is constructed the better. Lieut. Maury, in a letter on the subject, in answer to inquiries made by Senator Dodge, of Iowa, respecting the advantages we would have over the English by such a railroad, in our trade with China, says, "the California route, as it will be with a railroad hence, and a line of steamers on the Pacific to Shanghai, in comparison with the English routes as they now are, will give a difference in our favor of twenty-five or thirty days." To this great fact we wish to direct the attention of our people. We do not say how the road is to be constructed, nor do we propose what shall be the route, (who can do so correctly?) but we do say that such a road should be built as soon as possible. Will this be done? if not, let us say but little about our enterprise and sagacity.

Events of the Week.

Milk for Lubricating Wool.—Before wool can be carded, spun, and woven, it is well greased with a suitable unctuous substance. Various matters have been employed as substitutes for oil, because the item for such an expense in a year in any large factory, is very large. A few years ago, a patent was taken out for the employment of steam as a substitute for it, but we believe, it has not answered the purpose. By a late English paper, we learn that the price of olive oil, the substance used for wool in the manufacturing districts, had arisen so high ($200 per ton) that many experiments were made to get a suitable substitute, and that sweet milk was discovered to answer every purpose, when mixed along with a small quantity of olive oil; it is even asserted that it answers better than olive oil alone. Practice is the only way to test the value of any such discovery; we know that pure olive oil and soda, dissolved in water, make a composition which looks, tastes, and smells very like sweet milk. It is extensively used in dyeing and softening colored goods, and for dressing black silk. The milk cannot be such a good substance as olive oil—in our opinion—for treating wool, but its greater cheapness will enable manufacturers to use it in greater quantities.

New Quartz Crushing Machine—The "London Illustrated News" thus speaks of a rather singular machine for crushing quartz: "It consists of an iron chamber with safety valves on its upper part. A mortar is charged with powder and filled with quartz and is discharged into the chamber by one of the valves. The quartz is reduced to powder, and a bellows makes the powder of the silex fly out at one part, while the gold dust, by its specific gravity, like as in some of our grain separating machines, drops down into another chamber." This as described by the "News," is certainly the most novel and powerful means of quartz crushing and separating that has yet been brought before the world. We are inclined to the opinion that the process is an exceedingly dangerous and explosive one.

Phillips' Submarine Propeller—Mr. L. D. Phillips, whose submarine propeller was illustrated on page 172, writes us, stating that he can raise and submerge his vessel rapidly simply by filling up the water cylinder with water, and he can again rise to the surface as quickly by forcing out the water through a tube in the bottom by means of the air acting upon the surface of the water, it being forced in by the air-pump. In case the force of the air is not enough, the water can be let into the cabin, and forced out with a force pump; or without discharging ballast, the action of the paddles will force the vessel up to the surface. This propeller can also be made to stand at any depth of water.

Newell's Wire Gauze Lamp—We have received a letter from Prof. J. R. Nichols, of Haverhill, Mass., to correct an opinion, which has gone abroad respecting Prof. Silliman having committed himself in favor of Newell's device of wire gauze in fluid lamps. Prof. Nichols says he has received a letter from that distinguished gentleman, in which he says: "in my remarks respecting safety lamps, I say if they are faithfully constructed, they are safe, and I have made no allusion to Mr. Newell as an inventor or any other person, as it regards claims or skill. If I understand you correctly, you believe in the sufficiency of wire gauze protectors, if properly constructed and applied, and my opinion endorses nothing more." Prof. Nichols says,—"justice to Prof. Silliman and to the public will doubtless lead you to correct an erroneous impression, which places a distinguished and excellent gentleman in an unpleasant position." We always aim to get the truth—the whole truth, and nothing but the truth—to present to our readers. We are therefore always happy to present any statement in correction of an error, or to remove any wrong impression from the public mind. The letter of Prof. Silliman dated Jan. 29th ult., and which was published in the "Boston Traveller," would lead any person to infer that he had committed himself in favor of the said lamp. It concludes with these words, "The danger (explosions) may be entirely avoided by the use of Wire Gauze Protectors that have been recently introduced. It may be proper to add that I have no interest whatever in the invention."

Public Virtue in Public Men—Alas for our country! at the present day, it has almost unenvious name for corruption in our public men. The Common Council of the City of New York stands at the present moment blackened and stained with more corruptible characters than any corporation of the rottenest Rotten Borough of Old England. The common impression on the public mind is, that the majority of public men have their price, and that many know exactly what that price is. The late Grand Jury of the City and County of New York, indicted two of the New York Aldermen for receiving money illegally, and it was perhaps owing to the refusal of witnesses to testify, that no more were included in the verdict. The whole of our Aldermen have also been found guilty of contempt, of a decree of the Superior Court, and they stand before the public in a very degraded light. Never in the whole history of our country has such a city been so disgraced by the acts of its corporate authorities. A reform of our City Charter is demanded, and large meetings have been held by our citizens to accomplish that object; but neither new charters nor penal laws can make corrupt men virtuous. Good men will enact good laws, and execute them faithfully; corrupt men will violate good laws, or make bad ones for their own purposes. Our respectable citizens—the moral, intelligent and influential among all classes, rich and poor, are to blame for not doing their duty, in placing men of good character in power. The taxes in the City of New York, are higher than those in London or any city in the world, and yet no city is worse governed. A reform is certainly demanded, but it must be a moral one, to do any good.

Stuart's Naval and Mail Steamers of the United States.

This is a new publication, by C. B. Stuart, Engineer in Chief of the U.S. Navy, published by Chas. B. Norton, Irving House, this city; i is the companion to the previous splendid work of Mr. Stuart—"The Naval Dry Docks of the United States." In our opinion it is the most splendid work on engineering ever published in this or any other country; it certainly is a book of which the author may well feel proud. It is illustrated with 36 fine engravings, and is printed on beautiful paper. It has a beautiful steel engraving of the author, and a very fine one of the U. S. Mail Steamer Arctic of the Collins' Line. It contains an account with engravings of the "Demologos," or Fulton's first war steamer, and the history of every steamer employed and belonging to the United States Government,—with full descriptions, of construction and performance—is presented. Only 26 steamers, from first to last, have belonged to our government, and at the present moment, our navy is sadly defective in the quantity and quality of her steamships. We hope this work will be the means, of directing attention to the acquirement of a more efficient and powerful steam naval force. The old "Demologos" (Fulton the first) is illustrated, and a comparison with it and the Fulton the third, the fastest steamship in the Navy, presents as much difference between the old and new steamship, as there is between a log hut and Trinity Church. We are certainly under a debt of gratitude to the author of this work; and so are all American citizens, for it is a work on American Engineering of which they can boast. It is dedicated to E. K. Collins, the enterprising Chief of the Collins' Line of steamers, and the engines of the "Arctic" are fully illustrated and described. The illustrations are the finest engravings of machinery ever presented to our people.

In some future number we will take occasion to review, not the book, but, the progress and practice of engineering, as brought to light and recorded therein.

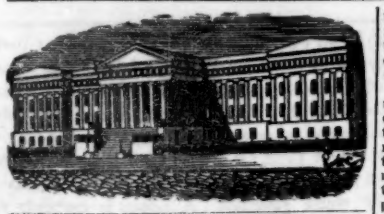
The Inauguration.

On Friday, the 4th instant, Franklin Pierce was sworn into office as Chief Magistrate of the United States, for four years. There was an exceedingly pompous procession escorting the President elect to the Capitol, and the president *de facto* from the Capitol. From the descriptions given of the procession, and the display made on the occasion, we cannot but think that it was altogether undemocratic except in this, that it was a voluntary affair got up by the people, and in this respect it only differed from coronation scenes in Paris and London. We believe that pomp fudge, and display are becoming integral parts of our system; we regret this. Republican simplicity, which is a just manifestation of good sense, is giving way to gaudy nonsense in our love of display—leather and prunella.

The President's Message has the merit of being short, clear, and on the whole good. What changes may take place before his administration closes, the Power above alone knows. The President has now a heavy load upon his shoulders, and very arduous duties to perform. Presidents and princes are not the most happy men. There was something in the prayer of the old Puritan, "Lord do not make me a king."

Paint for Coating Wire Work.

Take good linseed oil and boil it along with as much litharge as will make it of the consistency to be laid on with the brush. Lampblack is also put on at the rate of one part to every ten, by weight, of the litharge; boil three hours over a gentle fire. The first coat should be thinner than the others; experience has proven this to be the correct method of applying the paint.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 1, 1853

BEDSTEAD FASTENINGS—By Asa N. & Alden Case, of Gustavus, Ohio—We do not claim the pawl and ratchet, but we claim the combination of the inclined plane and head, with the pawl and two ratchets, for the purpose of fastening bedsteads and tightening the cord, as specified.

SWIVEL NIBBED KEYS FOR DOOR LOCKS—By A. C. Harig, of Louisville, Ky.: I am aware that the nib of the key has been fitted into the tubular shank, and so secured therein by a pin fitting into a groove that the burglar's instrument, when applied to the nib, would rotate it without moving the key; also that the key, by a plate attached to the inner lock plate, has been held so that it could not be rotated; but I claim the guard bit attached to the swivel nib in combination with the ordinary bit and shank of the key, constructed and operating as set forth.

ROTARY STEAM ENGINES—By James McKay, of Philadelphia, Pa.; I claim the passages for the exhaust steam, arranged so that they shall cover and encircle the entire periphery of the stationary cylinder, and have their ingress and egress openings so arranged as to cause the exhaust steam, as it escapes, to envelope the whole surface of the cylinder, as described.

In combination with the ordinary valves and parts which form a passage for the steam, to and from the engine, I claim the supplemental exhaust parts and valves, which act in conjunction with the ordinary exhaust valves, whereby a free egress for the exhaust steam is afforded without leaving large open passages for the steam to waste in.

Also, the combination of the sliding pistons, with self-adjusting valves and steam-ways, which admit a portion of the steam that propels the piston, behind its inner end, to act as a spring to press it out into the steam space, whichever way the engine may be turning.

Also mounting or hanging the two cylinders on radial and axial journals, respectively, arranged in a common plane, and at right angles to each other, whereby the two cylinders can accommodate themselves to each other, so as to avoid binding, as set forth.

MACHINE FOR MAKING AXES—By Jonas Simmons of Cohoes, N. Y.: I do not claim the employment of rolling dies for shaping an axe; but I claim the arrangement of the rolling dies with a rest bar to support the iron whilst being rolled, and an eye bar, arranged not only to serve as a mandrel to shape the eye of the axe, but with the rest bar to hold the iron firm during the process of rolling, the rest bar and eye bar being connected with the machinery, to give them appropriate movements, to cause them to co operate with the rolls, in shaping the axe, and these parts, further in combination with a scarfing bar, for the purpose of shaping the blade to receive the steel point in order to complete the axe, substantially as set forth.

SUPPLEMENTAL VALVE IN RECIPROCATING STEAM ENGINES—Chas. A. Spring, of Kensington, Pa.: I claim the arrangement of a valve in the lid of the steam chest, or the equivalent thereof, between the cylinder of a steam engine and the boiler, in such manner that it will prevent the reflux of the lead steam, by closing, whenever the pressure of the steam in the engine excludes toat in the boiler, and opening again whenever the pressure in the boiler is greater, substantially as herein set forth.

LOOMS—Wm. Townshend, of Hinsdale, Mass.: I do not claim actuating the pickers by the backward motion of the lay alone, but, first, I claim the cam wheel on the chain shaft, right angle lever, and staples or slide bolts combined and acting as described to bring the picking motion into operation alternately on each side by the backward motion of the lay as specified.

Second, actuating the picker staffs by the lay on its backward motion by means of the vibrating studs, when combined with levers attached to the swords of the lay, and two bent levers, arranged and combined in the manner described.

Third, the two levers are connected together by the adjustable pin so as to give greater or less motion to the selvage warp, when actuated by the cam as described.

Fourth, the apron or straps connected to the bar, and kept to the cloth by proper weight or power, so as to cause sufficient friction to wind the cloth on the cloth beam, when said apron and bar are moved or actuated from the lay or otherwise, so as to produce the effects herein described.

BEDSTEAD FASTENINGS—E. Sumner Taylor, of Cleveland Ohio: I do not claim separately the pawl and ratchet, nor a continuous right and left hand screw, but, I claim the combination of the pawl and ratchet with the spiral grooved sections attached to the tenons arranged and applied in the manner and for the purpose herein specified, namely; the tenons of one side rail and one end rail, being furnished with the plate, having the spiral groove turning to the right and left as described, making a tight joint with the post; the other side and end rails having on their tenons a groove, passing around the tenon at right angles to the axis and fitting the pins, as described, so that by having one side of the tenon on each end flattened to enable it to pass the pin, in order to allow it to enter the groove, when by turning in either direction, less than a complete revolution, the pin fitting into the groove prevents the posts and rails from separating, and by attaching the ratchets to the end of this side rail and one end of the end rail, with the pawls attached to the posts as specified, by tightening of the cord put on in the manner described, the whole frame of the bedstead is held firmly together by the combined action of all the parts described, one end rail and one side rail remaining stationary, the other end rail and side rail turning as described for the purpose of tightening the cord, both being secured by the pawl and ratchet.

CURRY COMBS—By Wm. Wheeler, of Troy, N. Y.: I claim the application of a ring, loop, or fixture on curry combs, for the insertion of a thumb as a guard and rest therefor, the ring or loop being made in one piece with the back strap, as set forth.

RE-ISSUE.

BRAKES FOR CARS—By Nehemiah Hodge, of North Adams, Mass. Dated Oct. 2, 1849: I am aware that the brakes of a car made with trucks or truck frames have been connected in different ways, so that the brakes of both trucks could be brought down simultaneously upon the wheels by the action of either windlass.

I therefore do not claim any machinery for doing merely this, but when this has been done the machinery applied to the windlasses and brakes of the trucks has not been such as to cause, under all, or nearly all circumstances, while the car is in operation, or running on a railway track, in which there may be curves or deflections from straight lines in the laying of its rails, and when either windlass is put in operation, the like amount of force which may be brought to act upon the brake lever of one truck, to act (through movable rod, or connecting mechanism) upon the brakes of the opposite truck.

I therefore claim my improvement in actuating the brakes of a car having two trucks, that is to say, a combination of four levers and three rods, as applied to the brakes and two windlasses of the car, and operated by either of the windlasses so as to bring down at the same time the brakes of both trucks upon the wheels thereof with the same or practically the same degree of force, and whether when the car is running on the railway the axles of one truck or of the wheels of one truck are thrown or moved out of parallelism with those of the other truck, or the rubbers, or brakes become unequally worn, or of an unequal thickness as above stated.

Extension of a Patent.

On the petition of J. Augustus Roth, of Fairmount, Philadelphia Co., Pa., praying for the extension of a patent granted to him on the 31st of Oct., 1839, for an improvement in furnaces for smelting ores, for seven years from the expiration of said patent, which takes place Oct. 31st, 1853.

It is ordered that the said petition be heard at the Patent Office on Monday, the 3rd of Oct., 1853, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which which will be furnished on application.

S. H. HODGES, Com. of Pat.

Washington, March 2, 1853.

Miscellaneous News of the Week.

The Fresnel apparatus selected for the light-house on Sand Key, Fla., will be a brilliant flash light of the first magnitude, and may be expected to be lighted by the 1st of June.

The Metropolitan Mechanics' Fair, now in progress in the east wing of the Patent Office, has drawn together thousands of persons from the cities and surrounding country.

A line of steamers is to be established between New Bedford and New York.

The large blast pipe at the Crane Iron Works, Catasuqua, Lehigh, Pa., burst on the 24th ult. The works were damaged to an extent of $40,000. Two furnaces turning out forty tons per day, were stopped. It will take three months to repair the damages.—No one was hurt.

The bill for the reduction of the value of our silver coin has been approved by the President, and goes into operation on the 1st of June next.

Experiments have been lately made at Chicago to ascertain the amount of oxygen necessary to support life. Six hundred persons having been placed in a hall in one of the hotels of that city all the doors and windows were closed, at the end of the third half hour it was found unsafe to continue the experiment any longer.

A doctor of Tarbes has left 25,000 francs reward for the discovery of the disease which kills off one-third of the yearly produce of leeches.

Depth of the Ocean.

Captain Denham, Royal Navy, now prosecuting a scientific voyage, recently read a paper at the Royal Society, in which the deepest sounding of the ocean ever made was recorded. On the passage from Rio de Janeiro to the Cape of Good Hope, in 36°, 49′, south latitude, and 27°, 6′, west longitude, on a calm day, the ocean was ascertained to be 7,706 fathoms deep, or 7·7 geographical miles.

C. L. Chatten, Esq., of Camden, S. C., will please accept our thanks for a barrel of delicious sweet potatoes received from him a few days since. They came in good condition and were excellent specimens of South Carolina growth.

Riddle's Report of the Great Exhibition.

[Continued from page 198.]

Although by artificial cultivation the quantity of humus in a soil may be increased almost to any degree, still, in spite of this, there cannot be the slightest doubt that a soil must gradually lose those of its constituents which are removed in the seeds, roots, and leaves of the plants raised upon it. The fertility of a soil cannot remain unimpaired, unless we replace in it all those substances of which it has been thus deprived. Now this can only be done by manure.

The manures thus used are divided in two classes:—

1. Animal or natural manures.
2. Chemical or artificial manures.

Among the most important of the animal manures are the excrements of animals. The peculiar property of earth in absorbing putrid effluvia, and removing disagreeable smells, appears an indication of nature, to lead us to bury putrid animal substances, of which the excrements and dead carcases of animals are the most numerous and obvious. It would require no length of experience to show that wherever this is done, vegetation is more vigorous. There is, therefore, another motive for burying manure than merely to get rid of a disagreeable substance. From the most ancient times, of which there are any records, the manuring of a field has been an important part of cultivation.

We may now inquire whether the excrements of animals are all of a like nature and power, and whether they in every case administer to the necessities of a plant by an identical mode of action. These points may easily be determined by ascertaining the composition of the animal excrements, because we shall thus learn what substances a soil really receives by their means. According to the common view, the action of solid animal excrements depends on the decaying organic matters which replace the humus, and on the presence of certain compounds of nitrogen, which are supposed to be assimilated by plants, and employed in the production of gluten and other azotized substances. But this view requires further confirmation with respect to the solid excrements of animals, for they contain so small a proportion of nitrogen, that they cannot, possibly, by means of it, exercise any influence upon vegetation.

We may form a tolerably correct idea of the chemical nature of the animal excrements, without further examination by comparing the excrements of a dog with its food. When a dog is fed with flesh and bones, both of which consist in great part of organic substances containing nitrogen, a moist white excrement is produced, which crumbles gradually to a dry powder in the air. This excrement consists of the phosphate of lime of the bones, and contains scarcely 1-100 part of its weight of foreign organic substances. The whole process of nutrition of an animal consists in the progressive extraction of all the nitrogen from the food, so that the quantity of this element found in the excrements must always be less than that contained in the nutriment.

When horse excrement is treated with water, a portion of it, to the amount of three or three and a half per cent., is dissolved, and the water is colored yellow. The solution is found to contain phosphate of magnesia and salts of soda, besides small quantities of organic matters. The portion of the excrement undissolved by the water yields to alcohol a resinous substance, possessing all the characters of gall, which has undergone some change; while the residue possesses the properties of saw dust, from which all soluble matter has been extracted by water, and burns without any smell. One hundred parts of the fresh excrement of a horse, being dried at 212° Fah., leave from 25 to 31 parts of solid substances, and contain accordingly 69 to 75 parts of water. From the dried excrements we obtain variable quantities of salt and earthy matters, according to the nature of the food which has been taken by the animal. It results, then, that from 3,600 to 4,000 pounds of fresh horse manure, corresponding to 100 pounds of dry manure, we place on the land from 2,784 to 3,000 pounds of water, and from 730 to 800 pounds of vegetable matter, and also from 100 to 270 pounds of salt and other inorganic substances.

The latter are evidently the substances to which our attention should be directed, for they are the same which formed the component parts of the hay, straw, and oats with which the horse was fed. Their principal constituents are the phosphates of lime and magnesia, carbonate of lime, and silicate of potash; the first three of these preponderating in grains, the latter in hay. Thus, in 1,000 pounds of horse manure, we present to a field the inorganic substances in 6,000 pounds of hay, or 8,300 pounds of oats.

The peculiar action, then, of the solid excrements is limited to their inorganic constituents, which thus restore to a soil that which is removed in the form of roots or grain.—When we treat land with the manure of the cow or sheep, we supply it with silicate of potash and some salts of phosphoric acid; and when enriched with the manure of the horse, we supply it with silicate of potash and phosphate of magnesia. In the straw which has served for a litter, we add a further quantity of silicate of potash and phosphates; which, if the straw be putrefied, are in exactly the same condition in which they were before being assimilated. It is evident, therefore, that the soil of a field will alter but little if we collect and distribute the manure carefully. A certain portion of the phosphate, however, must be lost every year, being removed from the land with grain and cattle; and this portion will accumulate in the neighborhood of large towns. The loss thus suffered must be compensated for in a well managed farm; and this is partly done by allowing the fields to lie in grass. It is considered that, for every 100 acres of corn land, there should be 20 acres of pasture land, which produce annually, on an average, 5,000 pounds of hay. Then, assuming that the ashes of the excrements of the animals fed with this hay amount to nearly seven per cent., 341 pounds of the silicate of lime, and phosphates of magnesia and lime, must be yielded by these excrements, and will, in a certain degree, compensate for the loss which the land had sustained.

We could keep our fields in a constant state of fertility by replacing every year as much as we remove from them in the form of produce; but an increase of fertility, and consequent increase of crop, can only be obtained when we add more to them than we take away. It will be found that of two fields placed under conditions otherwise similar, the one will be most fruitful upon which the plants are enabled to appropriate more easily, and in greater abundance, those contents of the soil which are essential to their growth and development.

It will now be easily understood that, for animal excrements, other substances containing their essential constituents may be substituted. In Flanders, the yearly loss of the necessary richness in the soil is completely restored by covering the fields with ashes of wood or bones, which may or may not have been lixiviated, and of which the greatest part consists of the phosphates of lime and magnesia. The great importance of manuring with ashes has been long known by agriculturists. Now, bone manure possesses a still greater importance in this respect. The primary sources from which the bones of animals are derived are hay, straw, or other substances used as food. If we admit that bones contain 55 per cent. of the phosphates of lime and magnesia, and that hay contains as much of them as wheat straw, it will follow that eight pounds of bones contain as much phosphate of lime as 1,000 pounds of hay or wheat straw, and two pounds of it as much as 1,000 pounds of the grain of wheat or oats. These numbers express pretty nearly the quantity of phosphates, which a soil yields annually on the growth of hay and corn. Now, the manure of an acre of land with 40 pounds of bone dust is sufficient to supply three crops of wheat, clover, turnips, &c., with phosphates. But the form in which they are restored to a soil does not appear to be a matter of indifference; for, the more finely the bones are reduced to powder, and the more intimately they are mixed with the soil, the more easily are they assimilated.

TO CORRESPONDENTS.

J. M., of Pa.—We do not know of any work devoted especially to distilling or, one which contains the information you want respecting alcohol.

H, S B., of N. Y.—Your lathe for turning irregular forms is constructed upon the same principle as the Blanchard patent; J. M. Quinby, of Newark, is the assignee and manufacturer of this lathe.

O. H. Warner, Macon, Ga.—Wants a portable steam power for sawing wood. What is its cost? Its power? How many cords of wood will it saw per day on an average? And how much help is required to work it? Address as above.

H. M. L., of Ohio—It is not patentable to make window sash, or any other article, of cast-iron, there is nothing patentable in your proposed change

G. H. A., of N. Y.—We do not know of any such patent as you mention.

J. B. M., of Tenn.—It is very questionable about your obtaining a patent for your apparatus. We see no chance for a claim.

J. R R., of Ohio.—We could not send all the back numbers you wanted—this is the reason you have not received them.

W. S., of Ohio—We cannot give the information required about the washing machine. There are a vast quantity of patent washing machines.

W. A. K., of N. Y—We know nothing of the matter mentioned in your note. If fraud has been used, you have legal remedy in the Court of Equity.

H L, of Geo.—We can furnish you no satisfactory information in regard the points of enquiry in your letter. Perhaps by addressing the editors of the Cotton Planter at Baltimore, you may learn full particulars.

A H., of Ill.—There is nothing new in your plan. It is essentially the same as the one described in our last volume. We have seen a number of modifications of it all of the same character.

J. D R, of Pa.—Last year a patent was issued to Francis Wolle, of Bethlehem, Pa, for a machine for making paper bags. We believe it is the only one in use.

E C. B., of Mass—In Nim's patent 1851, a spring is used in the frame. It is not elliptic.

D. O, of Pa.—There is nothing patentable in your devices for operating window shutters.

R. W, of N Y.—The success of any undertaking depends upon its management. A good improvement in the castor or the engine might be made pecuniarily valuable if well managed.

J M G, of N. H.—Such a brake as you describe has been in use many years, and several patents have been granted on modifications of it.

J A, and W. B. M., of Boston.—We think no patent can be obtained on your device, fleam teeth which answer the same purpose, are used in Tuttle's saw, and in Knowles' patent you will find a similar principle.

F. V., of Mich—Your subscription will not expire until no 26, next volume.

J. D B, of Ala—There is no system of pumps that we are aware of for supplying tanks of railroads. The situation of the place determines the kind of pump most suitable. A chain pump is as good as any in some places; a double force pump may be required in another place. The pump of Gwynne (centrifugal) is a very good one, and may be suitable for your purpose.

E. D. C, of Conn—We see no chance for a patent on your oil cup. Your advertisement was too long, therefore we omitted the first part. A single subscription to the Scientific American is not taken for less than $2.

A. F., of Mass.—It would scarcely make any difference whether the grit bed has a rotary or a reciprocating motion in a patentable point of view. We think it would not.

J. P. C., of N. Y.—Chapman has never issued any more numbers of his Drawing Book.

H. G. R., of Tenn.—You have nothing new in your churn. It is essentially similar to Chapin's patent, granted four years since. Other references might be given, but it is thought unnecessary.

J. . H, of Pa.—We do not discover any patentable novelty in your contrivance for transporting horse powers, and advise you not to apply.

C. W. S., of Conn.—The reason, we believe, why the paper of which the English books are composed is so much better than those in our country for writing is owing to the substances of which the two are composed being different. The English books are mostly printed on linen paper.

O. G., of Mich—You can furnish us with a rough pencil sketch of your wheel, and we will give you an opinion. The Morgan wheel is not the one referred to, and we have no extra number to send of the one referred to.

Money received on account of Patent Office business for the week ending Saturday, March 5 :—

O. B. T., of Pa, $30; W. H., of N. Y., $25; F. N., of N. Y., $40; C. P., of Mich., $20; F. C. G., of N. Y., $30; J. L., of N. H, $50; T. F., of Ct., $30; S. S, of N. Y., $67; C. D. B., of Ct, $30; W. C., of Mass., $30; N. C, of N. Y, $35; A. & S., of N. Y., $20; W W. & Co, of Pa, $40; G. G., of N. Y., $30; A. L, of N. J., $27; A. C, of Ct, $30; D Z., of Pa., $30; G. A. B., of Ill, $30; T S. G., of N. J., $30; J. I. V, of N. Y., $25; W. W. W., of Ct., $30; P. & R., of Ill, $35; E. B., of R. I., $25; T. O. C, of N. J., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday March 5 :—

F. N., of N. Y.; W. C, of Mass.; W. W. & Co., of Pa.; A. L, of N. J.; J. I. V., of N. Y.; T. O. C., of N. J.; E. B, of R. I.

A Chapter of Suggestions, &c.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement—Of Volumes 1, 2 and 3—none. Of Volume 4, about 20 Nos., price 50 cts. Of Volume 5, all but four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75 Of Vol. 7, all; price in sheets, $2; bound, $2,75. Of Vol. 8, none.

ADVERTISEMENTS.

Terms of Advertising.

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SCIENTIFIC MUSEUM.

Ericsson on "the Ericsson;" Stirling on "Stirling."

Some exceedingly funny and strange statements are now being published about hot air engines and their authors. Pliny Miles delivered a lecture in this city on the 1st inst., on Iceland, and after stating that this continent was first discovered by the Norsemen, under Eric the Red, he said, "Capt. Ericsson is believed to be one of his lineal descendants." It no doubt took more labor to make this discovery than to invent the hot air engine. Some of our daily papers have endorsed this discovery of the descendant of Eric the Red. The only powerful rival to the hot air engine, is Andrew Jackson Davis, the Seer. He, by the power of his *will*, has but to look into his press room, nod his head, and off goes his printing press. The "American Gazette," Phila., says, "It is stated by those who have seen the caloric engine in operation, that if no attention is paid to it, the only result will be, that when the fire goes out, the machinery will stop." These innocent remarks are made to show what a wonderful virtue there is in the caloric engine. We are led to infer from them that when the fires of a steam engine go out every person must run for life or death, for fear of an explosion, or that the machine will work away without any fuel at all.

Since the Ericsson has arrived at Alexandria, it has been visited by the great folks at Washington, and Capts. Ericsson, Sands, and Lowber, have made reports to Hon. J. P. Kennedy, now ex-Secretary of the Navy.—Capt. Ericsson's letter says, "the motion of the paddle wheels was more continuous than that of steamships, owing to the powerful momentum of the double pistons which form a main feature in the caloric engine." This is really a captivating feature in engineering. The next time Messrs. Stillman, Allen & Co., or Charles W. Copeland design a pair of marine engines, they must put in four single acting cylinders, instead of two double ones, because you see gentlemen, to give them a more powerful momentum, all you have to do is to increase the number of the pistons. By the reports of Capts. Sands and Lowber the Ericsson's wheels made only 6½ revolutions per minute in her trip to the Potomac; taking the diameter of her wheels and allowing 25 per cent. for slip—a fair allowance—she made only 5½ miles per hour—this will never do. A correspondent of the "Brooklyn Eagle—an engineer—says, "she would take 48 days to go to Liverpool at the rate she took to go from New York to Alexandria."—He advises the owners to own up at once. A proposition was made to that generous old gentleman, Uncle Sam, to build him two war ships with Ericsson's engines. The Hon. J. P. Kennedy calls hot air "a new motive power;" he must certainly be posted up in inventions. It is singular how philanthropic all the owners of doubtful inventions are in respect to the welfare of Uncle Samuel, for how the hot air engines with most of the machinery above water line, and with single acting cylinders having huge pistons which neither can work horizontally nor on an incline, can answer for war vessels, we are at a loss to determine.

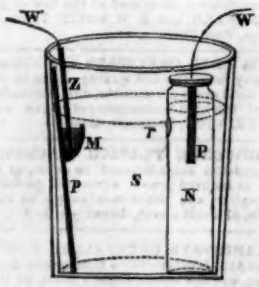
A remarkable instance of collateral testimony to prove what we have said about Stirling's claims to the hot air engine has just been presented. A number of the "Glasgow Advertiser" of January says, that about thirty years ago a boat named the Highland Lad, fitted with hot air engines invented by Dr. Stirling—the engines were built by Claud Girdwood—ran for some time on the Clyde, but the heat soon destroyed the furnaces and cylinders; it says that Ericsson's engines are but a modification of Stirling's. A nephew of Dr. Stirling's, living in Canada, in a letter to the "Montreal Transcript," 31st January, which we have before us, says, "he saw the hot air engine of his uncle in Claud Girdwood's Foundry." Thus two witnesses, unknown to one another, and living three thousand miles separate, have given testimony in favor of all we have stated. But to put this question at rest for ever, and to nail the insinuations thrown out by some of our daily papers in the teeth of their authors, respecting the truth of what we have said, we say that a description with two engravings of Stirling's hot air engine was published in our country in 1828, on pages 314, 15, and 16, of the "Jour. of the Franklin Inst.," Vol. 5, where our readers will find said illustrations and description. We perceive that since we referred our readers to documents where they would find a description of Stirling's hot air engine, in the "London Mechanics' Magazine," that the said information has been published by a cotemporary. We are glad to see that it is published, and that our cotemporary and others are now viewing the matter in its true light, yet let us say that a very minute and full description of Stirling's hot air engine was published by us five years ago on pages 134 and 142, Vol. 3, Scientific American, before one was commenced in this country by Capt. Ericsson, and which embraces his principle of refrigeration, and as it respects economy of size far surpasses it. If those professedly eminent and literary men who have called this caloric engine "a new power," had been constant readers of the Scientific American, they would not have made themselves so eminently ridiculous as they have done by exposing their ignorance about inventions.

On the 3rd inst., Mr. Gwin, from the Naval Committee in the Senate, moved that a frigate be constructed with Ericsson engines, at a cost not exceeding $500,000. The motion was rejected by a vote of 27 nays, 19 yeas. The owners of the Ericsson, if the improvement is so superior to steam as is alleged, need not regret the decision, for they will be able to compete and surpass all our steamships. It is said that the Ericsson is going to Australia, and from thence to England. It would please us better if it made its first voyage from New York to Liverpool. Give the Ericsson a fair trial, and let her by deeds prove that all those who have expressed themselves on the negative side of the question, have been mistaken. We make this assertion, that in three years, perhaps less, a hot air engine in a ship will be among the things that were.

Farmer's Improved Sustaining Battery.

It is well known that the Grove's Battery is the best of any in use for most purposes, and also the most expensive; it is very intense, but must be kept in first rate order or it is valueless. Several months since Mr. Farmer (of the Boston Fire Alarm) entered upon a series of experiments, in order to obtain a battery which should have all of the properties of a Grove's, with less trouble in keeping it in action, and a saving of expense.

We give an engraving of the battery with an accompanying description.



The outer cell is of stone ware, holding a gallon or more; it is filled with the sulphuric solution, S, one of acid to twelve or fifteen of water. Standing in this cell is another jar, N, holding about a quart. This cell is filled with the nitric acid solution, one of acid and about four of water. The cell is made of common biscuit ware or glass, and glazed inside and out, save at the point *r*. This is the porous part of the cell. The glazing prevents the filtering of the nitric acid through into the sulphuric solution, and it also offers a greater resistances to the passage of the current. It is by altering the porosity of the cell that the right proportion between the solid and fluid resistance of the circuit is obtained, and thereby the greatest amount of magnetic force, according to the general law given by Ohm, that the solid and fluid resistances of a circuit should be equal. The cells may be made of glass and a porous piece inserted or blown in. The nitric cells are covered, and the platinum strip, P, goes through it, and is soldered to the gutta percha covered wire, W. By covering the cell, the nitrous fumes are almost imperceptible, and by soldering the wire and platinum upon the outside of the cover, one trouble which so often occurs in Grove's is avoided—the unsoldering of platinums. On the left hand side of the outside cell, and standing within it is a pocket, *p*; it is made of common biscuit ware, and resembles a comb-case. In the pocket is some mercury, M, and standing in the mercury is the zinc, Z, and by its side is the other pole wire of the battery, W, which is also covered with gutta percha, save near the end which is immersed in the mercury. This is one cell; a series of them are arranged as in any other.

The advantages to be derived from this form of battery are the following:—

1st. Its great duration—it has been in use several months upon the short lines of the City Fire Alarm, and needs replenishing about once in four months. Upon long lines it will probably maintain its action much longer. A battery set up on the 8th of November is now (Feb. 25th) in good order; it has been used by several daguerreotypists with complete success. Mr. Whipple, an artist of Boston, well-known for his genius and perseverance in photography, had one in action four months, without renewal of acid or disturbance of any kind. L. H. Hale, another artist, had one set up the 2nd Nov., and is in good action at the present time.

2nd. Its constancy.—The magnetometer gives but a slight variation of magnetic force, remaining almost stationary during the whole time. All telegraphers know the trouble of a variable current, and for silvering purposes it has the constancy of Smee's and the intensity of Grove's.

3rd. The use of zinc in any form—In the Grove's the zinc must be of a particular form, and the arms are frequently eaten off at the acid line, before the body is consumed, which renders the whole useless except as old zinc. In this form of battery all scraps of zinc of commerce may be used.

4th. The amalgamation of zinc—In Grove's it is well known that unless the zinc is kept clean by an amalgam, that the action is variable. In this battery the zinc should be amalgamated when first put into the acid, and then by capillary attraction the mercury is drawn upon it, always keeping it bright and in a condition for the acid to act.

5th. No waste of mercury—This is no inconsiderable item of expense, in a Grove's, but here it is not exhausted, remaining in the pocket when the zinc is dissolved, and ready to act its part again.

6th. The prevention of nitrous fumes, which are so disagreeable—This is accomplished by the cover upon the nitric cell which also prevents evaporation—a great source of loss in the Grove's.

7th. The diminished porosity which has been before illustrated.

8th. Its economy—From all the various sources of gain, it amounts, in the aggregate, to a great deal. From eight months' trial it would seem to be about fifty per cent., which will be a great item in telegraphing in this country, where competition and low rates tell largely upon the balance sheet.

Light for Churches and Lecture Rooms.

Messrs. Editors—You must have suffered at evening lectures or sermons from the glaring lights which almost always surround the speaker, and which produce pain in the eyes and drowsiness. Now, in observatories, a single lamp, centrally placed, sends through lenses of perhaps 1½ inches diameter, beams of light to all points in the room, which it is desired to illuminate,—such are the dials of the clocks. The portions of the graduated limbs of the astronomical instruments, &c., are many feet distant from the source of light,—a spherical shade cuts off all the rays except those which are sent through these lenses. Thus a couple of lamps or gas jets on the galleries, one on each side of the preacher or lecturer, might through three or four inch lenses, send two beams to the pages of his book, while the painful lights generally disposed about him, would be removed, much to the satisfaction of his audience, who would not suffer from headache, and who would be less apt to sleep.

M. C. M

Washington, D. C., Feb. 20, 1853.

[We hope the above suggestions will be acted upon by many of our churches.—Ed.

An iron foundry has been started at Deseret, Utah, for the manufacture of hollow ware. Saleratus and brimstone are found there in quantities.

LITERARY NOTICES.

Anderson's American Villa Architecture—This is a new work on Architecture, by Charles F. Anderson, of this city, and published by G. P. Putnam & Co., Park Place: it is to be completed in seven parts, each containing three separate designs, and a supplementary number containing working drawings, specifications, &c

The style of architecture is entirely different from any that has heretofore been presented in the many works published on the same subject in our country. The author, an eminent architect, has travelled through Europe, and has minutely inspected the architecture of the various nations there; he has also visited every State and city, from the Gulf of St. Lawrence to that of Mexico, and he has come to the conclusion, after thirty years' study, that he has produced a new style of architecture suited to the climate of our country, and the customs and habits of the age This first number presents three designs, each containing two splendid lithographic perspective views, together with sections, for gentlemen's mansions. This is, we think, the finest work on architecture that has yet been presented to the American public.

The School Fellow—A Magazine for Boys and Girls. Terms $1 per annum; New York. C. M. Saxton, 152 Fulton street; Charleston, B. F. De Bow; Chillicothe, O, Whittemore & Saxton.—The above is the title of a monthly magazine, intended for the rising generation, and is well deserving of the patronage of parents, as a useful and instructive book to place in their children's hands. In our times, when periodical literature has become so important and the newspaper and magazine are almost a necessary of life, it is wise for every one from among the host of publications that are daily, weekly, and monthly presented to their notice, to select with care those that are worthy of their patronage. If this is judicious in their own case, it becomes a still more imperative duty to use caution and judgment with respect to the works that their children read. Much good or much harm may be done to the tender mind, whilst it unconsciously sips the honey or the distilled poison; we cannot, therefore, too earnestly call the attention of those of our readers who have families to the necessity of discretion in this respect; we would therefore particularly recommend to their notice the above periodical, which is expressly intended for the young, and which contains a fund of useful and instructive reading, together with many capital illustrations. As a literary work it has merits of a high order, and although written down to the comprehension of children, its pages show that its writers can, if necessary, write up to the understanding of those of larger growth. The "School Fellow" is an ably got up work, and does credit to all concerned about it, whether publishers, editors, contributors, artists, or mechanics. Parents cannot subscribe to a better work to place in their children's hands.

Littell's Living Age—No. 460 of this excellent magazine, by Littell & Son Boston, contains 17 articles selected from the very choicest of European periodicals. One on the Fire Annihilator, from the "London Examiner," is exceedingly rich: it compares D'Israeli's Budget to the apparatus—promising everything.

Minifie's Mechanical Drawing—No. 5 of this excellent work, for self-instruction in this important art, is just issued and for sale by Dewitt & Davenport, this city.